

TUNNEL INSPECTION REPORT

ST. ELIZABETHS HOSPITAL – WEST CAMPUS
WASHINGTON, D.C.



Report Prepared by:
Burgess & Niple, Inc.
4160 Pleasant Valley Road
Chantilly, VA 20151

Date: February 2006

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ST. ELIZABETHS- WEST CAMPUS

Underground Tunnel Study

Background

St. Elizabeths, consisting of over 300 acres separated into West and East Campuses, is a former mental hospital run by the Federal Government in Anacostia of SE Washington, D.C. The entire compound has been declared a National Historic Landmark. The Federal Government turned over operations of the hospital to the District of Columbia in 1987, while maintaining ownership of the West Campus.

The West Campus consists of 176 acres with 61 buildings which are in a deteriorated state. The buildings are currently under renovation for future operations. A matrix of underground tunnels on the West Campus exists between many of the buildings. The West Campus contains buildings that date back to the earliest development of St. Elizabeths Hospital (SEH), originally named Government Hospital for the Insane (GHI). The hospital was also used to treat U.S. soldiers during the Civil War and has a Civil War cemetery on the West Campus.

The early campus, 1855 to 1900, existed as a self-sufficient community. The campus consisted of buildings for various functions such as General Kitchen, Bakery, Detached Dining Hall, Detached Kitchen, Center Hall including the East and West Wings as well as buildings for staff residence. These buildings were generally connected with an underground tunnel with a small track bed, presumably used with carts for distribution of materials.

In the absence of existing documentation on these tunnels, a convention for naming the tunnel based on the building numbers that the tunnel connected was utilized. Eighteen tunnels totaling 3,865 feet in length were inventoried, and the walk through inspection of these tunnels was performed December 12 through 14, 2005. The presentation of results from these structural assessments provides the purpose for this report.

Scope of Work

1) Current Structural Condition of Underground Tunnels

Assess the current structural condition of the existing underground tunnels and recommend the necessary upgrades needed to restore these tunnels to a functional usable space as a passageway for people and a passageway for utilities.

Observations from the site visit: An old utility drawing appears to indicate roughly 33 tunnels totaling around 6,000 lf; however, many of these “tunnels” are too small for passageways and deemed to be pipe chases for the steam and condensate pipe system. The table on the following page lists the tunnels that were assessed.

No.	Name	Building No./Name	Building No./Name	Length	Type
1	1-3	1 Center Hall	3 West Wing	170	Basement
2	1-4	1 Center Hall	4 East Wing	170	Basement
3	3-5	3 West Wing	5 Garfield	425	Basement/Horseshoe
4	3-46	3 West Wing	46 Bakery	95	Basement
5	4-6	4 East Wing	6 Pine	305	Basement
6	6-8	6 Pine	8 Willow	110	Basement
7	6-28	6 Pine	28 Linden	120	Basement/Horseshoe
8	8-8	8 Willow	8 Willow	80	Basement
9	28-29	28 Linden	29 Holly	65	Horseshoe
10	29-30	29 Holly	30 Det. Nurses Home	55	Horseshoe
11	31-32	31 Atkins Hall	32 Relief	60	Horseshoe
12	31-33	T 31-44	33 Det. Dining Hall	75	Horseshoe
13	31-38	T 31-44	38 Hagen Hall	640	Horseshoe
14	31-44	31 Atkins Hall	44 Old Storeroom	405	Horseshoe
15	32-32	32 Relief (N)	32 Relief (S)	200	Basement
16	72-73	72 M Building	73 C Building	275	Basement
17	73-74	73 C Building	74 Administration	315	Basement
18	74-75	74 Administration	75 B Building	300	Basement
			Total	3,865 LF	

Two other tunnels were identified, one connecting the north and south ends of Center Hall (Buildings 1 and 2); however, no track bed appears to exist. The other tunnel connecting Allison A, Building 25 to Allison B, Building 26 has been blocked off at each end.

At ground level, many of the surface vents were found to be accessible. Each tunnel access inside the building was readily found directly under the main stairway. Two types of “tunnels” were assessed; ten of the eighteen had track-beds running along “basement” type hallways and six of the eighteen had track-beds in brick or brick-lined arch or horseshoe type tunnels. Two of the tunnels were combinations where a significant portion of the tunnel was basement type while another significant portion was horseshoe type.

Tasks:

- Assess current conditions of the existing underground tunnels. The tunnels were structurally sound; however, the basement type particularly Tunnels 1-3, 1-4, 3-5, 4-6, and 6-8 where the tunnel ceiling is the floor above still have sections where the floor above has not yet been replaced. Many of these areas are significantly deteriorated and decayed to the point of collapse. The walls were structurally sound with only minor mortar joint cracks.

The horseshoe type had some isolated areas of undermining under the floor pavers (bricks); however, the floors were otherwise structurally sound. The walls and arches were also sound; however, Tunnels 6-28, 31-44, and 31-38 cross

underneath roadways. At the time of the assessment, no evidence of Live Load distress was noted. The thickness of the fill over the tunnel and under the roadways was measured during the geotechnical investigation. Tunnel 6-28 is a brick horseshoe type corridor which routes below the parking lot south of the East Wing Building. Tunnels 31-38 and 31-44 are brick horseshoe type corridors which partially run below roadways Redwood Drive and Hemlock Street. All these tunnels have shallow cover ranging from 5" to 10.5" below the roadway. Although preliminary calculations indicated that these tunnels will not be overstressed by the standard HS 20 Live Load, they will be exposed to large vibratory forces due to truck traffic on this shallow cover. Vibrations could severely damage the mortar joints in the masonry and therefore require some means of distributing this load over a larger area. Steel plates covered with asphalt wearing surface placed on the roadways or parking lot immediately above each of these tunnels could adequately distribute these vehicular traffic loads.

- b) Recommend necessary upgrades needed to restore these tunnels to a functional use as passageways for people or utilities. For the complete list, see Recommendation Table in Appendix (page 11).

Basement Type Tunnels:

- Tunnels 1-3 and 1-4 both have areas where the ceiling (timber framed floor above) has not yet been replaced. These areas need to be replaced or at a minimum have shoring installed on a priority basis.
- To utilize Tunnels 1-3, 1-4, 3-46, 4-6, 6-8 and 8-8 as passageways for people or utilities,
 - 1) debris will need to be removed from the floor
 - 2) electric lines will need to be replaced
 - 3) lighting conduit, fixtures and wiring will need to be replaced
- To utilize Tunnels 73-74 and 74-75 as passageways for people or utilities,
 - 1) electric lines will need to be replaced
 - 2) lighting conduit, fixtures and wiring will need to be replaced
- To utilize Tunnel 32-32 as passageways for people or utilities,
 - 1) debris will need to be removed from the floor
- To utilize Tunnel 72-73 as passageways for people or utilities,
 - 1) the undermined area of the floor will need to be repaired
 - 2) the electrical conduit will need repair/ replacement at one location

Horseshoe and Basement/Horseshoe Combination Tunnels:

- The brick-arch/horseshoe tunnels are generally too narrow to be utilized as a passageway for people; however, they could readily be utilized as a passageway for utilities.

- To utilize Tunnels 6-28, 28-29 and 29-30 as passageways for utilities,
 - 1) debris will need to be removed from the floor
 - 2) electric lines will need to be replaced
 - 3) lighting conduit, fixtures and wiring will need to be replaced
- To utilize Tunnels 31-32 and 31-33 as passageways for utilities,
 - 1) electric lines will need to be replaced
 - 2) lighting conduit, fixtures and wiring will need to be replaced
- To utilize Tunnels 31-38 and 31-44 as passageways for utilities,
 - 1) debris will need to be removed from the floor
 - 2) electric lines will need to be replaced
 - 3) lighting conduit, fixtures and wiring will need to be replaced
 - 4) water leak through lining will need to be sealed
- Tunnel 3-5 has an area of severely deteriorated ceiling (timber floor above). These timber members need to be replaced on a critical basis. Additionally other distressed areas will require replacement on a priority basis. This tunnel ends under Building 5 as a brick arch too narrow for people yet adequate for utilities. Further, to utilize the basement portion as a passageway for people or utilities,
 - 1) debris will need to be removed from the floor
 - 2) electric lines will need to be replaced
 - 3) lighting conduit, fixtures and wiring will need to be replaced
- In addition to the above noted recommendations Tunnels 6-28, 31-38, and 31-44 pass underneath roadways and can be subjected to vehicular loads. These vehicular loads will transfer vibrations that could severely damage the mortar joints in the masonry. Therefore it is strongly recommended that some means of distributing this load over a larger area be utilized. Steel plates covered with asphalt wearing surface placed on the roadways or parking lot would provide this means of adequately distributing these vehicular traffic loads.

2) Rehabilitation Feasibility

Issue a report on feasibility (cost effectiveness) to stabilize and rebuild these tunnels to a usable space as a passageway for people and a passageway for utilities.

Most of the basement type tunnels will be adequate for a passageway space for pedestrians after recommended repairs have been made. Several of the basement corridors do not have sufficient head clearance for passageways due to low ceilings or low vertical clearance below pipes; however, will be acceptable for maintenance access and routing utilities. The horseshoe type brick arch tunnels will not be adequate for pedestrian passageways, but will be acceptable for pipe chases and maintenance access.

Seven of the brick arch tunnels have inadequate vertical clearances for pedestrian use. Tunnel 3-5 has a brick arch portion near the west end that is unsatisfactory for pedestrian passage; however, the remainder will be sufficient for usage as a passageway. Although these tunnels are inadequate for pedestrian use, they will serve well as pipe chases. Tunnels 6-28, 28-29, 29-30, 31-33, 31-38, and 31-44 have restricted vertical clearance due to pipes running across the tunnels from wall to wall. Tunnel 31-32 has a utility pipe running the length of the tunnel that reduces the vertical clearance to an amount unsatisfactory for pedestrian traffic.

Tunnels 31-38 and 31-44 are brick horseshoe type corridors which partially run below roadways. Tunnel 6-28 is a brick horseshoe type corridor which routes below a parking lot. All three of these tunnels have a shallow cover ranging from 5" to 10.5" to the roadway above. Although these tunnels will not be utilized for pedestrian traffic, we recommend the installation of steel plates overtopped with asphalt placed on the roadways or parking lot above to adequately distribute the vehicular traffic loads.

Horseshoe Type Tunnels (adequate for pipe chases only)					
Name	Building No. / Name	Building No. / Name	Length		
3-5	3	West Wing	5	Garfield	75
6-28	6	Pine	28	Linden	70
28-29	28	Linden	29	Holly	65
29-30	29	Holly	30	Det. Nurses Home	55
31-32	31	Atkins Hall	32	Relief	60
31-33	T	31-44	33	Det. Dining Hall	75
31-38	T	31-44	38	Hagen Hall	640
31-44	31	Atkins Hall	44	Old Storeroom	405
				Total	1445 LF

Tunnels 6-28, 72-73, and 74-75 have restricted vertical clearance due to pipes running across the tunnels from wall to wall. Tunnel 72-73, additionally, has a low ceiling to begin with, which causes the tunnel to appear constricted to pedestrian traffic. Some of these tunnels have pipes protruding an undesirable amount from the walls into the walkway.

Basement Type Tunnels (adequate for pipe chases only)					
Name	Building No. / Name	Building No. / Name	Length		
6-28	6	Pine	28	Linden	50
72-73	72	M Building	73	C Building	275
74-75	74	Administration	75	B Building	300
				Total	625 LF

Tunnels 1-3, 1-4, 3-46, 4-6, 6-8, 8-8, 32-32, 73-74, and part of 3-5 will be acceptable for pedestrian passageways; however, will require some work before use. The main items which must be performed prior to utilization of the tunnels for pedestrian passageways involve debris removal, refurbishing of electrical lines, and installation of a new lighting system. Occupancy codes will likely require a sprinkler system to be installed in these tunnels, primarily in the corridors without windows. Tunnels 1-3, 1-4, 3-5, 4-6, and 6-8 have ceilings composed of timber flooring for the floor above. Some of these sections have recently been or are in the process of being replaced while other sections were in an advanced state of deterioration at the time of inspection.

Basement Type Tunnels (adequate for pedestrian use)				
Name	Building No. / Name	Building No. / Name	Length	
1-3	1	Center Hall	3	West Wing
1-4	1	Center Hall	4	East Wing
3-5	3	West Wing	5	Garfield
3-46	3	West Wing	46	Bakery
4-6	4	East Wing	6	Pine
6-8	6	Pine	8	Willow
8-8	8	Willow	8	Willow
32-32	32	Relief (N)	32	Relief (S)
73-74	73	C Building	74	Administration
				Total
				1795

3) Cost Estimate

Include a cost estimates for design and construction to upgrade/restore the tunnels to useable space.

All the tunnels will need basic maintenance items addressed in order to be utilized for either pedestrian use or pipe chases with maintenance access. The basic repairs are lighting and electrical modifications, as well as debris removal. A couple of the tunnels have some water leakage through an area on a wall and local undermined areas beneath the floor. These are shown in the estimated cost tables on the following pages. The estimated costs include all material and labor necessary to perform the work.

The table on the following page shows estimated repair costs for nine basement type tunnels that are adequate for pedestrian use and pipe chases. Estimated repair costs shown on the following table for tunnel 3-5 are only for the basement type portion which will handle pedestrian traffic.

Basement Type Tunnels (utility and pedestrian use)					
Tunnel	Recommendation	Quantity	Unit	Unit Cost	Est. Cost
				\$	\$
1-3	Remove debris from floor.	10	CY	220	2200
	Replace electric lines.	170	LF	4	680
	Replace lighting conduits and wiring.	170	LF	6.5	1105
1-4	Remove debris from floor.	20	CY	220	4400
	Replace electric lines.	170	LF	4	680
	Replace lighting conduits and wiring.	170	LF	6.5	1105
3-5 (partial)	Remove debris from floor.	45	CY	220	9900
	Replace electric lines.	350	LF	4	1400
	Replace lighting conduits and wiring.	350	LF	6.5	2275
3-46	Replace electric lines.	95	LF	4	380
	Replace lighting conduits and wiring.	95	LF	6.5	620
4-6	Remove debris from floor.	5	CY	220	1100
	Replace electric lines.	305	LF	4	1220
	Replace lighting conduits and wiring.	305	LF	6.5	1985
6-8	Remove debris from floor.	5	CY	220	1100
	Replace electric lines.	110	LF	4	440
	Replace lighting conduits and wiring.	110	LF	6.5	715
8-8	Remove debris from floor.	2	CY	220	440
	Replace electric lines.	80	LF	4	320
	Replace lighting conduits and wiring.	80	LF	6.5	520
32-32	Remove debris from floor.	1	CY	220	220
73-74	Replace electric lines.	315	LF	4	1260
	Replace lighting conduits and wiring.	315	LF	6.5	2050
				Total	36,200

The table below shows estimated repair costs for three basement type tunnels that are not adequate for mainstream pedestrian use; however, are adequate for pipe chases and maintenance access. All three of these tunnels as described in section 2 are deemed undesirable for pedestrian use due to low vertical clearances.

Basement Type Tunnels (utility and maintenance access use only)					
Tunnel	Recommendation	Quantity	Unit	Unit Cost	Est. Cost
				\$	\$
6-28 (partial)	Remove debris from floor.	2	CY	220	440
	Replace electric lines.	50	LF	4	200
	Replace lighting conduits and wiring.	50	LF	6.5	325
72-73	Repair undermined area of floor.	50	SF	80	4000
	Repair electrical conduit at kink in tunnel.	2	LF	250	500
74-75	Replace lighting conduits and wiring.	300	LF	6.5	1950
				Total	7,500

The following table shows estimated repair costs for eight horseshoe type tunnels that are inadequate for pedestrian use. Estimated repair costs shown below for tunnel 3-5 are only for the horseshoe type portion that will not adequately handle pedestrian traffic. Tunnel 6-28 is composed of a combination of both basement and horseshoe type tunnels. The horseshoe type portion is tabulated below.

Horseshoe Type Tunnels (utility and maintenance access use only)					
Tunnel	Recommendation	Quantity	Unit	Unit Cost	Est. Cost
				\$	\$
3-5 (partial)	Remove debris from floor.	5	CY	220	1100
	Replace electric lines.	75	LF	4	300
	Replace lighting conduits and wiring.	75	LF	6.5	490
6-28 (partial)	Remove debris from floor.	3	CY	220	660
	Replace electric lines.	70	LF	4	280
	Replace lighting conduits and wiring.	70	LF	6.5	455
28-29	Replace electric lines.	65	LF	4	260
	Replace lighting conduits and wiring.	65	LF	6.5	425
29-30	Remove debris from floor.	2	CY	220	440
	Replace electric lines.	55	LF	4	220
	Replace lighting conduits and wiring.	55	LF	6.5	360
31-32	Replace electric lines.	60	LF	4	240
	Replace lighting conduits and wiring.	60	LF	6.5	390
31-33	Replace electric lines.	75	LF	4	300
	Replace lighting conduits and wiring.	75	LF	6.5	490
31-38	Remove debris from floor.	20	CY	220	4400
	Replace electric lines.	640	LF	4	2560
	Replace lighting conduits and wiring.	640	LF	6.5	4160
	Repair water leak in lining near south end.	1	LUMP SUM	5000	5000
31-44	Repair undermined brick floor at west end.	50	SF	40	2000
	Replace lighting conduits and wiring.	405	LF	6.5	2635
	Repair water leak in north wall lining.	1	LUMP SUM	5000	5000
	Remove debris from floor.	5	CY	220	1100
				Total	33,300

A portion of tunnels 6-28, 31-38, and 31-44 run below a roadway or parking lot. The amount of cover over these tunnels ranges from 5" to 10.5". Due to this shallow depth of cover, it is recommended that a steel plate be placed below the asphalt wearing surface to evenly distribute the loads and minimize any vibrations from vehicular traffic. The estimated costs tabulated below include a 3/4" thick steel plate, asphalt removal, asphalt placement, and associated labor to perform the work.

Horseshoe Type Tunnels Below Roadways and Parking Lot				
Tunnel	Recommendation	Quantity	Unit	Est. Cost
				\$
6-28	Place steel plate and asphalt overlay above tunnel.	1	Lump Sum	15,000
31-38	Place steel plate and asphalt overlay above tunnel.	1	Lump Sum	15,000
31-44	Place steel plate and asphalt overlay above tunnel.	1	Lump Sum	15,000
			Total	45,000

The table below summarizes the total estimated cost by tunnel type. The tunnels are grouped as described in the preceding tables.

Summary of Estimated Costs by Tunnel Type	
Type	Est. Cost
	\$
Basement Type Tunnels (utility and pedestrian use)	36,200
Basement Type Tunnels (utility and maintenance access use only)	7,500
Horseshoe Type Tunnels (utility and maintenance access use only)	33,300
Horseshoe Type Tunnels Below Roadways and Parking Lot	45,000
	Total
	122,000

APPENDIX

SUMMARY OF RECOMMENDATIONS

Tunnel	Critical	Priority	Routine
1-3	None	Shore or replace deteriorated timber flooring not yet repaired.	1. Remove debris from floor, 10 CY. 2. Replace electric lines, 170 LF. 3. Replace lighting conduits and wiring, 170 LF.
1-4	None	Shore or replace deteriorated timber flooring not yet repaired.	1. Remove debris from floor, 20 CY. 2. Replace electric lines, 170 LF. 3. Replace lighting conduits and wiring, 170 LF.
3-5	Shore or replace deteriorated timber flooring, above, 200 SF.	Shore or replace deteriorated timber flooring not yet repaired.	1. Remove debris accumulation, 50 CY. 2. Replace electric lines, 425 LF. 3. Replace lighting conduits and wiring, 425 LF.
3-46	None	None	1. Replace electric lines, 95 LF. 2. Replace lighting conduits and wiring, 95 LF.
4-6	None	None	1. Remove debris from floor, 5 CY. 2. Replace electric lines, 305 LF. 3. Replace lighting conduits and wiring, 305 LF.
6-8	None	None	1. Remove debris from floor, 5 CY. 2. Replace lighting conduits and wiring, 110 LF. 3. Replace electric lines, 110 LF.
6-28	None	None	1. Remove debris from floor, 5 CY. 2. Replace electric lines, 120 LF. 3. Replace lighting conduits and wiring, 120 LF.
8-8	None	None	1. Remove debris from floor, 2 CY. 2. Replace electric lines, 80 LF. 3. Replace lighting conduits and wiring, 80 LF.
28-29	None	None	1. Replace electric lines, 65 LF. 2. Replace lighting conduits and wiring, 65 LF.
29-30	None	None	1. Replace electric lines, 55 LF. 2. Replace lighting conduits and wiring, 55 LF. 3. Remove debris from floor, 2 CY.
31-32	None	None	1. Replace electrical lines, 60 LF. 2. Replace lighting conduit and wiring, 60 LF.
31-33	None	None	1. Replace electrical lines, 75 LF. 2. Replace lighting conduits and wiring, 75 LF.
31-38	None	None	1. Remove debris from floor, 20 CY. 2. Replace electric lines, 640 LF. 3. Replace lighting conduits and wiring, 640 LF. 4. Repair water leak through lining near south end, Lump Sum.
31-44	None	None	1. Repair undermined brick floor at west end of tunnel, 50 SF. 2. Replace lighting conduits and wiring, 405 LF. 3. Repair water leak through north wall, Lump Sum. 4. Remove debris from floor, 5 CY.
32-32	None	None	1. Remove debris from floor, 1 CY.
72-73	None	None	1. Repair electrical conduit at kink in tunnel, 2 LF. 2. Repair undermined area of floor, 50 SF.
73-74	None	None	1. Replace lighting conduits and wiring, 315 LF. 2. Replace electric lines, 315 LF.
74-75	None	None	1. Replace lighting conduit and wiring, 300 LF.

TUNNEL INSPECTION REPORT

ST. ELIZABETHS HOSPITAL – WEST CAMPUS
WASHINGTON, D.C.
TUNNEL BETWEEN BUILDINGS 1 & 2



NORTH PORTAL



SOUTH PORTAL

Report Prepared by:
Burgess & Niple, Inc.
4160 Pleasant Valley Road
Chantilly, VA 20151

Inspection Date: 12/13/05

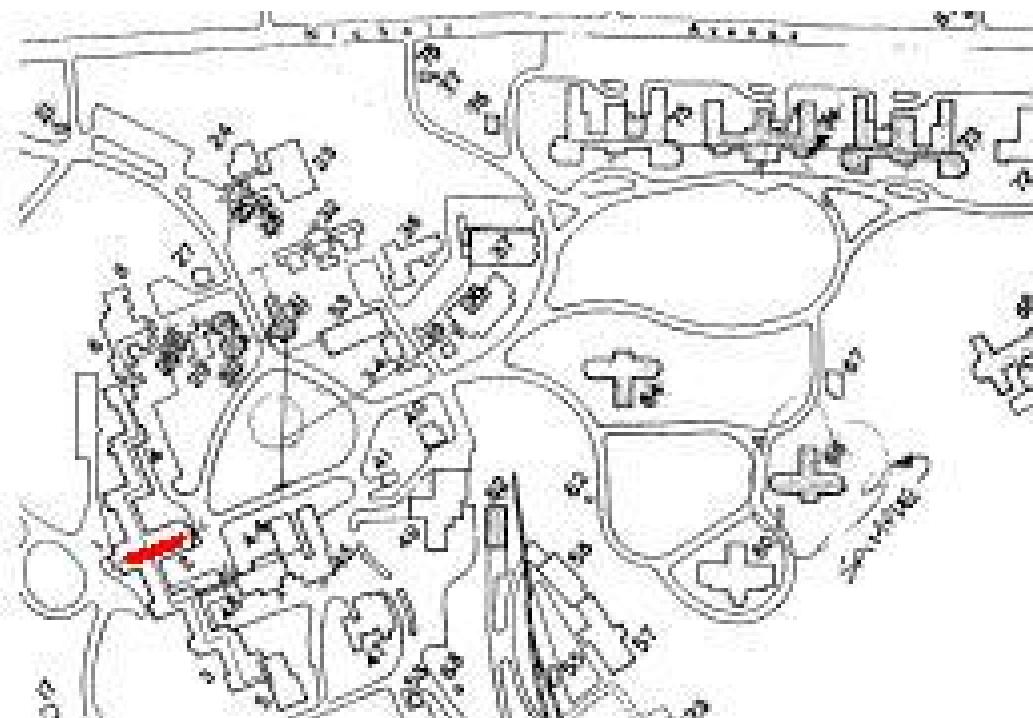
TUNNEL IDENTIFICATION AND DESCRIPTION

Lining Material	Brick/Stone
Total Length	N/A
Springline Width	N/A
Begin Building	1
End Building	2

Tunnel Height	N/A
Year Constructed	1900 (est.)
Year Reconstructed	
Entry Through Building	1, 2

Tunnel previously connected the basement of Building 1, Center Hall North to the basement of Building 2, Center Hall South. Currently no evidence of the track way exists; the main chamber under the building appears to be more basement than tunnel.

LOCATION MAP



INSPECTION TEAM: T. Suthers, J. Wolfe (Burgess & Niple, Inc.)

EXECUTIVE SUMMARY

Currently no evidence of the track way exists; the main chamber under the building appears to be more basement than tunnel. Building 1 was at the north end of the tunnel and Building 2 is at the south end. The walls are composed of brick and stone masonry.

RECOMMENDATIONS

No Repairs Required

Critical Repairs:

None.

Priority Repairs:

None.

Routine Repairs:

None.

FIELD INSPECTION REPORT**STRUCTURE NO. 1-2**
INSPECTION DATE: 12/13/05

CONDITION RATING CODES		
N	NOT APPLICABLE 9 EXCELLENT CONDITION 8 VERY GOOD CONDITION – no problems noted. 7 GOOD CONDITION – some minor problems. 6 SATISFACTORY CONDITION – structural elements show some minor deterioration. 5 FAIR CONDITION – all primary structural elements are sound but may have minor section loss, cracking, spalling, or scour. 4 POOR CONDITION – advanced section loss, deterioration, spalling, or scour. 3 SERIOUS CONDITION – loss of section, deterioration, spalling, or scour have seriously affected primary structural components. Local failures are possible. Fatigue cracks in steel or shear cracks in concrete may be present.	2 CRITICAL CONDITION – advanced deterioration of primary structural elements. Failure cracks in steel or shear cracks in concrete may be present or scour may have removed substructure support. Unless closely monitored it may be necessary to close the structure until corrective action can be taken. 1 “IMMINENT” FAILURE CONDITION – major deterioration or section loss present in critical structural components or obvious vertical or horizontal movement affecting structure stability. Structure is closed to traffic but corrective action may return structure to light service. 0 FAILED CONDITION – out of service; beyond corrective action.

CONDITION RATING CODE EQUIVALENTS FOR SUB-ELEMENTS

G = GOOD (CODES 7 – 9) F = FAIR (CODES 5 – 6) P = POOR (CODES 0 – 4)

59. TUNNEL	N
1. LINING	N
2. PORTALS	N
3. FLOOR	N
4. DRAINS & DRAINAGE	N
5. VENTILATION	N
6. OTHER	N
7. OTHER	N
8. OTHER	N

401. ACCESS ROOM	N
1. WALL	N
2. CEILING	N
3. FLOOR	N
4. STAIRWAY	N
5. OTHER	N
6. OTHER	N
7. OTHER	N

402. UTILITIES	N
1. STEAM	N
2. WATER	N
3. ELECTRICAL	N
4. GAS	N
5. FIBER OPTIC	N
6. OTHER	N
7. OTHER	N
8. OTHER	N

PHOTOS



Photo 1: North portal



Photo 2: South portal

TUNNEL INSPECTION REPORT

ST. ELIZABETHS HOSPITAL – WEST CAMPUS
WASHINGTON, D.C.
TUNNEL BETWEEN BUILDINGS 1 & 3



EAST PORTAL



WEST PORTAL

Report Prepared by:
Burgess & Niple, Inc.
4160 Pleasant Valley Road
Chantilly, VA 20151

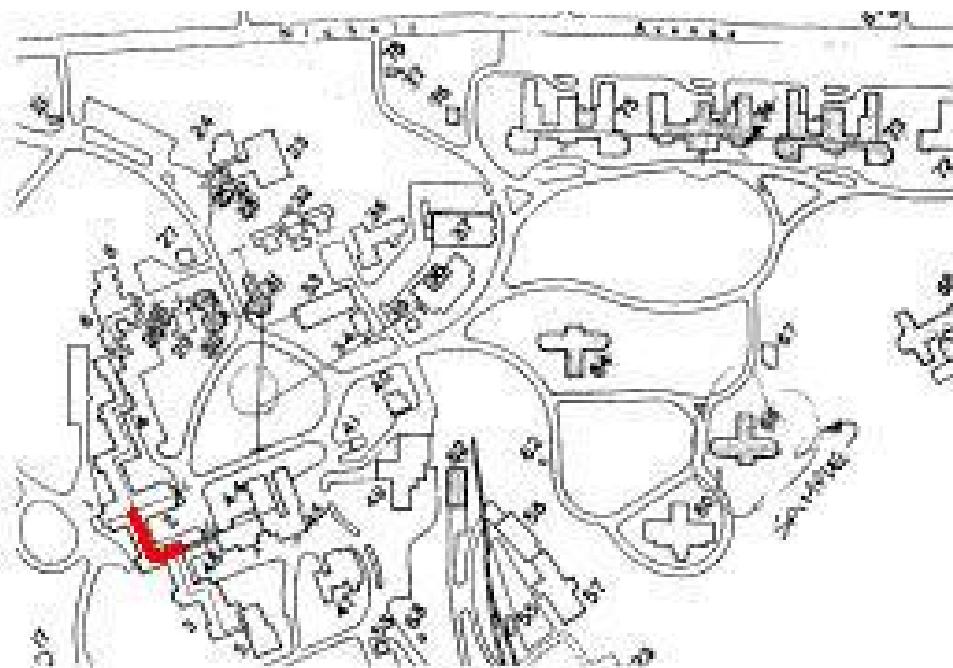
Inspection Date: 12/13/05

TUNNEL IDENTIFICATION AND DESCRIPTION

Lining Material	Brick
Total Length	170 FT
Springline Width	N/A
Begin Building	1
End Building	3

Tunnel Height	N/A
Year Constructed	1900 (est.)
Year Reconstructed	
Entry Through Building	1, 3

Tunnel connects the basement level of Buildings 1 & 2, Center Hall to the basement level of Building 3, West Wing.

LOCATION MAP

EXECUTIVE SUMMARY

This tunnel is 170 feet long and runs between Buildings 1 and 3. Building 1 is at the east end of the tunnel and Building 3 is at the west end. The tunnel walls are composed of brick and stone masonry and are in fair condition. Utilities within the tunnel at the time of inspection include steam, water, electrical, and communication (telephone). Minor problems at this time include several vertical cracks on the walls, moderate to heavy debris scattered on the floor, and deteriorated utilities. A more serious problem involves areas of deteriorated timber floor system above.

RECOMMENDATIONS**Critical Repairs:**

None.

Priority Repairs:

1. Shore or replace deteriorated timber flooring above not yet repaired.

Routine Repairs:

1. Remove debris from floor, 10 CY.
2. Replace electric lines, 170 LF.
3. Replace lighting conduits and wiring, 170 LF.

FIELD INSPECTION REPORT**STRUCTURE NO. 1-3**
INSPECTION DATE: 12/14/05

CONDITION RATING CODES			
N	NOT APPLICABLE	2	CRITICAL CONDITION – advanced deterioration of primary structural elements. Failure cracks in steel or shear cracks in concrete may be present or scour may have removed substructure support. Unless closely monitored it may be necessary to close the structure until corrective action can be taken.
9	EXCELLENT CONDITION	1	“IMMINENT” FAILURE CONDITION – major deterioration or section loss present in critical structural components or obvious vertical or horizontal movement affecting structure stability. Structure is closed to traffic but corrective action may return structure to light service.
8	VERY GOOD CONDITION – no problems noted.	0	FAILED CONDITION – out of service; beyond corrective action.
7	GOOD CONDITION – some minor problems.		
6	SATISFACTORY CONDITION – structural elements show some minor deterioration.		
5	FAIR CONDITION – all primary structural elements are sound but may have minor section loss, cracking, spalling, or scour.		
4	POOR CONDITION – advanced section loss, deterioration, spalling, or scour.		
3	SERIOUS CONDITION – loss of section, deterioration, spalling, or scour have seriously affected primary structural components. Local failures are possible. Fatigue cracks in steel or shear cracks in concrete may be present.		

CONDITION RATING CODE EQUIVALENTS FOR SUB-ELEMENTS

G = GOOD (CODES 7 – 9) F = FAIR (CODES 5 – 6) P = POOR (CODES 0 – 4)

59. TUNNEL	5	59.1	Several minor vertical cracks on walls. Sections of timber flooring above have been replaced while other sections remain in a deteriorated state.
1. LINING	F	59.6	Moderate to heavy debris scattered throughout areas.
2. PORTALS	G	402.1,2,3,6	Moderate to heavy corrosion on utility pipes and conduits. Some sections of pipes, conduits, and wiring are sagging and hanging from ceiling.
3. FLOOR	G		
4. DRAINS & DRAINAGE	G		
5. VENTILATION	G		
6. OTHER (Debris)	F		
7. OTHER	N		
8. OTHER	N		

401. ACCESS ROOM	N		
1. WALL	N		
2. CEILING	N		
3. FLOOR	N		
4. STAIRWAY	N		
5. OTHER	N		
6. OTHER	N		
7. OTHER	N		

402. UTILITIES	4
1. STEAM	P
2. WATER	P
3. ELECTRICAL	P
4. GAS	N
5. FIBER OPTIC	N
6. OTHER (Telephone)	P
7. OTHER	N
8. OTHER	N

PHOTOS



Photo 1: East portal



Photo 2: West portal



Photo 3: Looking east, east portal in distance; Note hanging electric and phone wires



Photo 4: Looking west; Note hanging conduits and wires



Photo 5: Looking west; Note new timber floor above and hanging utilities



Photo 6: Debris on floor



Photo 7: West portal, east face; Note vertical crack on south side



Photo 8: Debris on floor, looking west

TUNNEL INSPECTION REPORT

ST. ELIZABETHS HOSPITAL – WEST CAMPUS
WASHINGTON, D.C.
TUNNEL BETWEEN BUILDINGS 1 & 4



WEST PORTAL



EAST PORTAL

Report Prepared by:
Burgess & Niple, Inc.
4160 Pleasant Valley Road
Chantilly, VA 20151

Inspection Date: 12/13/05

TUNNEL IDENTIFICATION AND DESCRIPTION

Lining Material	Brick
Total Length	170 FT
Springline Width	N/A
Begin Building	1
End Building	4

Tunnel Height	N/A
Year Constructed	1900 (est.)
Year Reconstructed	
Entry Through Building	1, 2

Tunnel connects the basement level of Buildings 1 & 2, Center Hall to the basement level of Building 4, East Wing.

LOCATION MAP



INSPECTION TEAM: T. Suthers, J. Wolfe (Burgess & Niple, Inc.)

EXECUTIVE SUMMARY

This tunnel is 170 feet long and runs between Buildings 1 and 4. Building 4 is at the east end of the tunnel and Building 1 is at the west end. The tunnel lining is composed of brick and stone masonry and is in fair condition. Utilities within the tunnel at the time of inspection include steam, water, electrical, and communication (telephone). Minor problems at this time include debris scattered throughout floor and deteriorated utilities. A more serious problem involves areas of deteriorated timber floor system above.

RECOMMENDATIONS**Critical Repairs:**

None.

Priority Repairs:

1. Shore or replace areas of deteriorated timber flooring not yet repaired.

Routine Repairs:

1. Remove debris from floor, 20 CY.
2. Replace electric lines, 170 LF.
3. Replace lighting conduits and wiring, 170 LF.

FIELD INSPECTION REPORT**STRUCTURE NO. 1-4**
INSPECTION DATE: 12/13/05

CONDITION RATING CODES		
N	NOT APPLICABLE 9 EXCELLENT CONDITION 8 VERY GOOD CONDITION – no problems noted. 7 GOOD CONDITION – some minor problems. 6 SATISFACTORY CONDITION – structural elements show some minor deterioration. 5 FAIR CONDITION – all primary structural elements are sound but may have minor section loss, cracking, spalling, or scour. 4 POOR CONDITION – advanced section loss, deterioration, spalling, or scour. 3 SERIOUS CONDITION – loss of section, deterioration, spalling, or scour have seriously affected primary structural components. Local failures are possible. Fatigue cracks in steel or shear cracks in concrete may be present.	2 CRITICAL CONDITION – advanced deterioration of primary structural elements. Failure cracks in steel or shear cracks in concrete may be present or scour may have removed substructure support. Unless closely monitored it may be necessary to close the structure until corrective action can be taken. 1 “IMMINENT” FAILURE CONDITION – major deterioration or section loss present in critical structural components or obvious vertical or horizontal movement affecting structure stability. Structure is closed to traffic but corrective action may return structure to light service. 0 FAILED CONDITION – out of service; beyond corrective action.

CONDITION RATING CODE EQUIVALENTS FOR SUB-ELEMENTS		
G = GOOD (CODES 7 – 9)	F = FAIR (CODES 5 – 6)	P = POOR (CODES 0 – 4)

59. TUNNEL	5
1. LINING	F
2. PORTALS	G
3. FLOOR	G
4. DRAINS & DRAINAGE	G
5. VENTILATION	G
6. OTHER (Debris)	P
7. OTHER	N
8. OTHER	N

59.1	Sections of timber flooring above have been replaced while other sections remain in a deteriorated state.
59.6	Moderate to heavy debris scattered throughout floor in areas.
402.1,2,3,6	Moderate to heavy corrosion on pipes and conduits. Utilities are sagging and hanging from ceiling at east end of tunnel.

401. ACCESS ROOM	N
1. WALL	N
2. CEILING	N
3. FLOOR	N
4. STAIRWAY	N
5. OTHER	N
6. OTHER	N
7. OTHER	N

402. UTILITIES	4
1. STEAM	P
2. WATER	P
3. ELECTRICAL	P
4. GAS	N
5. FIBER OPTIC	N
6. OTHER (Telephone)	P
7. OTHER	N
8. OTHER	N

PHOTOS



Photo 1: West portal



Photo 2: East portal



Photo 3: General view of lining



Photo 4: Deteriorated timber floor system above;
Note new flooring in adjacent area



Photo 5: Heavy debris on floor



Photo 6: Unsupported and hanging utilities; Note debris on floor

TUNNEL INSPECTION REPORT

ST. ELIZABETHS HOSPITAL – WEST CAMPUS
WASHINGTON, D.C.
TUNNEL BETWEEN BUILDINGS 3 & 5



WEST PORTAL



EAST PORTAL

Report Prepared by:
Burgess & Niple, Inc.
4160 Pleasant Valley Road
Chantilly, VA 20151

Inspection Date: 12/14/05

TUNNEL IDENTIFICATION AND DESCRIPTION

Lining Material	Brick
Total Length	425.0 FT
Springline Width	6.0 FT
Begin Building	3
End Building	5

Tunnel Height	7.0 FT
Year Constructed	1900 (est.)
Year Reconstructed	
Entry Through Building	3

Tunnel connects the basement level of Building 3, West Wing to the basement level of Building 5, Garfield.

LOCATION MAP

EXECUTIVE SUMMARY

This tunnel is 425 feet long by 6 feet wide and runs between Buildings 3 and 5. Building 3 is at the east end of the tunnel and Building 5 is at the west end. The tunnel lining is composed of brick, stone masonry, and timber and is in fair condition. Utilities within the tunnel at the time of inspection include water, steam, and electric; none of which were functioning. Minor problems at this time include debris accumulation and deteriorated utilities. A more critical problem involves areas of deteriorated timber floor system above, some of which is settling.

RECOMMENDATIONS**Critical Repairs:**

1. Shore or replace deteriorated and settled timber flooring above, 200 SF.

Priority Repairs:

1. Shore or replace rest of deteriorated timber flooring above not yet repaired.

Routine Repairs:

1. Remove debris accumulation, 50 CY.
2. Replace electric lines, 425 LF.
3. Replace lighting conduits and wiring, 425 LF.

FIELD INSPECTION REPORT**STRUCTURE NO. 3-5**
INSPECTION DATE: 12/14/05

CONDITION RATING CODES			
N 9 8 7 6 5 4 3	NOT APPLICABLE EXCELLENT CONDITION VERY GOOD CONDITION – no problems noted. GOOD CONDITION – some minor problems. SATISFACTORY CONDITION – structural elements show some minor deterioration. FAIR CONDITION – all primary structural elements are sound but may have minor section loss, cracking, spalling, or scour. POOR CONDITION – advanced section loss, deterioration, spalling, or scour. SERIOUS CONDITION – loss of section, deterioration, spalling, or scour have seriously affected primary structural components. Local failures are possible. Fatigue cracks in steel or shear cracks in concrete may be present.	2 1 0	CRITICAL CONDITION – advanced deterioration of primary structural elements. Failure cracks in steel or shear cracks in concrete may be present or scour may have removed substructure support. Unless closely monitored it may be necessary to close the structure until corrective action can be taken. “IMMINENT” FAILURE CONDITION – major deterioration or section loss present in critical structural components or obvious vertical or horizontal movement affecting structure stability. Structure is closed to traffic but corrective action may return structure to light service. FAILED CONDITION – out of service; beyond corrective action.

CONDITION RATING CODE EQUIVALENTS FOR SUB-ELEMENTS		
G = GOOD (CODES 7 – 9)	F = FAIR (CODES 5 – 6)	P = POOR (CODES 0 – 4)

59. TUNNEL	5
1. LINING	F
2. PORTALS	G
3. FLOOR	G
4. DRAINS & DRAINAGE	G
5. VENTILATION	G
6. OTHER (Debris)	F
7. OTHER	N
8. OTHER	N

59.1	Sections of timber flooring above have been replaced while other sections remain in a deteriorated state. One section of deteriorated timber flooring above is settling.
59.6	Minor to moderate debris scattered along floor. Heavy debris accumulation near west end of tunnel.
402.1,2,3	Moderate to heavy corrosion on pipes and conduits. Conduit near west end has an area of total section loss.
402.3,6	Conduits and wiring sagging and hanging from ceiling.

401. ACCESS ROOM	N
1. WALL	N
2. CEILING	N
3. FLOOR	N
4. STAIRWAY	N
5. OTHER	N
6. OTHER	N
7. OTHER	N

402. UTILITIES	4
1. STEAM	P
2. WATER	P
3. ELECTRICAL	P
4. GAS	N
5. FIBER OPTIC	N
6. OTHER (telephone)	P
7. OTHER	N
8. OTHER	N

PHOTOS



Photo 1: West portal, bricked off



Photo 2: East portal



Photo 3: Deteriorated and settled timber flooring above



Photo 4: General view of tunnel, looking west from east portal



Photo 5: General view of tunnel deteriorated timber flooring above, looking west;
Note and corrosion on conduits and hanging wiring



Photo 6: Heavy debris on floor; Note hanging wiring



Photo 7: Heavy debris on floor; Note hanging pipe, conduits, and wiring



Photo 8: East portal of arch portion at west end of tunnel; Note heavy debris on floor



Photo 9: General view of lining, looking east from west portal



Photo 10: Corrosion on steam pipe, south wall



Photo 11: Corrosion on steam pipe in arch section of tunnel near west end



Photo 12: Corrosion with total section loss on conduit

TUNNEL INSPECTION REPORT

ST. ELIZABETHS HOSPITAL – WEST CAMPUS
WASHINGTON, D.C.
TUNNEL BETWEEN BUILDINGS 3 & 46



NORTH PORTAL



SOUTH PORTAL

Report Prepared by:
Burgess & Niple, Inc.
4160 Pleasant Valley Road
Chantilly, VA 20151

Inspection Date: 12/14/05

TUNNEL IDENTIFICATION AND DESCRIPTION

Lining Material	Brick
Total Length	95.0 FT
Springline Width	N/A
Begin Building	3
End Building	46

Tunnel Height	N/A
Year Constructed	1900 (est.)
Year Reconstructed	
Entry Through Building	3

Tunnel previously connected the basement level of Building 3, West Wing to the basement level of Building 46, Bakery. Currently the passage way at Building 46 is blocked off preventing access to the Bakery.

LOCATION MAP



EXECUTIVE SUMMARY

This tunnel is 95 feet long and runs between buildings 3 and 46. Building 3 is at the north end of the tunnel and building 46 is at the south end. The tunnel lining is composed of brick, stone masonry, and timber and is in good condition. Utilities within the tunnel at the time of inspection include steam, water, electrical and communication (telephone). Minor problems at this time include deteriorated utilities and minor debris on floor.

RECOMMENDATIONS**Critical Repairs:**

None.

Priority Repairs:

None.

Routine Repairs:

1. Replace electric lines, 95 LF.
2. Replace lighting conduits and wiring, 95 LF.

FIELD INSPECTION REPORT**STRUCTURE NO. 3-46**
INSPECTION DATE: 12/14/05

CONDITION RATING CODES			
N 9 8 7 6 5 4 3	NOT APPLICABLE EXCELLENT CONDITION VERY GOOD CONDITION – no problems noted. GOOD CONDITION – some minor problems. SATISFACTORY CONDITION – structural elements show some minor deterioration. FAIR CONDITION – all primary structural elements are sound but may have minor section loss, cracking, spalling, or scour. POOR CONDITION – advanced section loss, deterioration, spalling, or scour. SERIOUS CONDITION – loss of section, deterioration, spalling, or scour have seriously affected primary structural components. Local failures are possible. Fatigue cracks in steel or shear cracks in concrete may be present.	2 1 0	CRITICAL CONDITION – advanced deterioration of primary structural elements. Failure cracks in steel or shear cracks in concrete may be present or scour may have removed substructure support. Unless closely monitored it may be necessary to close the structure until corrective action can be taken. “IMMINENT” FAILURE CONDITION – major deterioration or section loss present in critical structural components or obvious vertical or horizontal movement affecting structure stability. Structure is closed to traffic but corrective action may return structure to light service. FAILED CONDITION – out of service; beyond corrective action.

CONDITION RATING CODE EQUIVALENTS FOR SUB-ELEMENTS		
G = GOOD (CODES 7 – 9)	F = FAIR (CODES 5 – 6)	P = POOR (CODES 0 – 4)

59. TUNNEL	7
1. LINING	G
2. PORTALS	G
3. FLOOR	G
4. DRAINS & DRAINAGE	G
5. VENTILATION	G
6. OTHER (Debris)	F
7. OTHER	N
8. OTHER	N

59.6	Minor debris on floor.
402.1,2,3	Moderate corrosion on utility pipes
402.6	Corroded wires with kinked and sagging sections.

401. ACCESS ROOM	N
1. WALL	N
2. CEILING	N
3. FLOOR	N
4. STAIRWAY	N
5. OTHER	N
6. OTHER	N
7. OTHER	N

402. UTILITIES	4
1. STEAM	P
2. WATER	P
3. ELECTRICAL	P
4. GAS	N
5. FIBER OPTIC	N
6. OTHER (Telephone)	P
7. OTHER	N
8. OTHER	N

PHOTOS



Photo 1: North portal



Photo 2: South portal

FIELD INSPECTION REPORT

STRUCTURE NO. 3-46
INSPECTION DATE: 12/14/05



Photo 3: Looking north from south portal



Photo 4: Looking south toward south portal

FIELD INSPECTION REPORT

STRUCTURE NO. 3-46
INSPECTION DATE: 12/14/05



Photo 5: Looking north toward north portal;
Note minor debris on floor



Photo 6: Blocked access way to Building 46

TUNNEL INSPECTION REPORT

ST. ELIZABETHS HOSPITAL – WEST CAMPUS
WASHINGTON, D.C.
TUNNEL BETWEEN BUILDINGS 4 & 6



EAST PORTAL



WEST PORTAL

Report Prepared by:
Burgess & Niple, Inc.
4160 Pleasant Valley Road
Chantilly, VA 20151

Inspection Date: 12/13/05

TUNNEL IDENTIFICATION AND DESCRIPTION

Lining Material	Brick, Stone
Total Length	305 FT
Springline Width	N/A
Begin Building	4
End Building	6

Tunnel Height	N/A
Year Constructed	1900 (est.)
Year Reconstructed	
Entry Through Building	1

Tunnel connects the basement level of Building 4, East Wing to the basement level of Building 6, Pine.

LOCATION MAP



EXECUTIVE SUMMARY

This tunnel is 305 feet long and runs between Buildings 4 and 6. Building 6 is at the east end of the tunnel and Building 4 is at the west end. The tunnel lining is composed of brick and stone rubble and is in good condition. Utilities within the tunnel at the time of inspection include water, steam, electric, and telephone; none of which were functioning. Minor problems at this time include light debris accumulation and deteriorated utilities.

RECOMMENDATIONS**Critical Repairs:**

None.

Priority Repairs:

None.

Routine Repairs:

1. Remove debris from floor, 5 CY.
2. Replace electric lines, 305 LF.
3. Replace lighting conduits and wiring, 305 LF.

FIELD INSPECTION REPORT**STRUCTURE NO. 4-6**
INSPECTION DATE: 12/13/05

CONDITION RATING CODES			
N	NOT APPLICABLE	2	CRITICAL CONDITION – advanced deterioration of primary structural elements. Failure cracks in steel or shear cracks in concrete may be present or scour may have removed substructure support. Unless closely monitored it may be necessary to close the structure until corrective action can be taken.
9	EXCELLENT CONDITION	1	“IMMINENT” FAILURE CONDITION – major deterioration or section loss present in critical structural components or obvious vertical or horizontal movement affecting structure stability. Structure is closed to traffic but corrective action may return structure to light service.
8	VERY GOOD CONDITION – no problems noted.	0	FAILED CONDITION – out of service; beyond corrective action.
7	GOOD CONDITION – some minor problems.		
6	SATISFACTORY CONDITION – structural elements show some minor deterioration.		
5	FAIR CONDITION – all primary structural elements are sound but may have minor section loss, cracking, spalling, or scour.		
4	POOR CONDITION – advanced section loss, deterioration, spalling, or scour.		
3	SERIOUS CONDITION – loss of section, deterioration, spalling, or scour have seriously affected primary structural components. Local failures are possible. Fatigue cracks in steel or shear cracks in concrete may be present.		

CONDITION RATING CODE EQUIVALENTS FOR SUB-ELEMENTS

G = GOOD (CODES 7 – 9) F = FAIR (CODES 5 – 6) P = POOR (CODES 0 – 4)

59. TUNNEL	7
1. LINING	G
2. PORTALS	G
3. FLOOR	G
4. DRAINS & DRAINAGE	G
5. VENTILATION	G
6. OTHER (debris)	F
7. OTHER	N
8. OTHER	N

59.6	Minor debris on floor in areas throughout.
402.1,2,3	Moderate to heavy corrosion on pipes and conduits. Some pipes and conduits are unsupported and hanging from ceiling.
402.6	Telephone lines are loose from ceiling and hanging in areas.

401. ACCESS ROOM	N
1. WALL	N
2. CEILING	N
3. FLOOR	N
4. STAIRWAY	N
5. OTHER	N
6. OTHER	N
7. OTHER	N

402. UTILITIES	7
1. STEAM	P
2. WATER	P
3. ELECTRICAL	P
4. GAS	N
5. FIBER OPTIC	N
6. OTHER (Telephone)	F
7. OTHER	N
8. OTHER	N

PHOTOS



Photo 1: East portal



Photo 2: West portal



Photo 3: General view looking west from east portal; Note hanging wiring

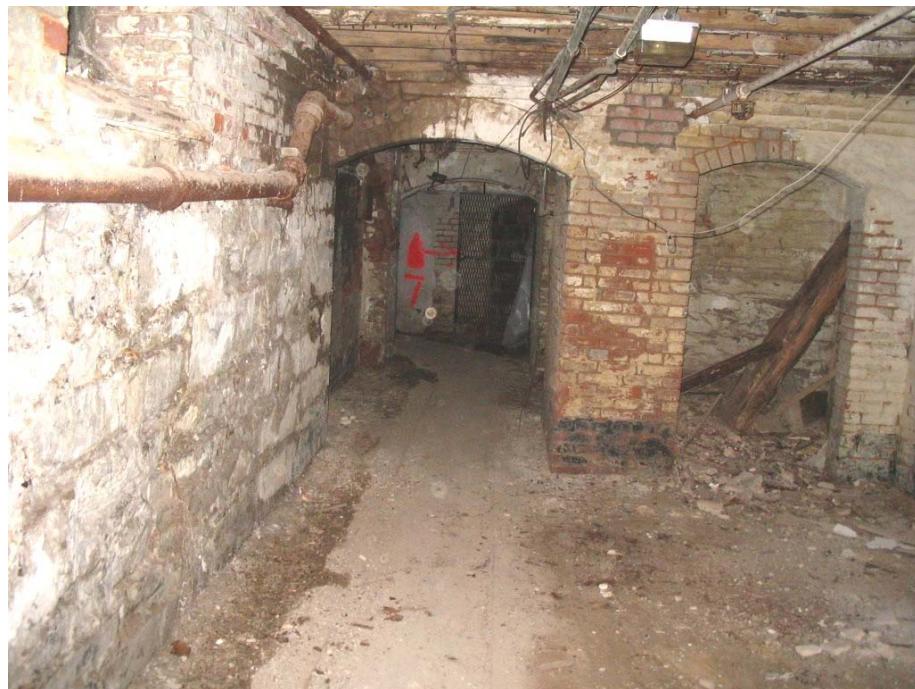


Photo 4: General view looking west; Note debris on floor,
hanging wiring, and corrosion on pipes



Photo 5: General view looking west



Photo 6: Debris on floor; Note hanging conduits



Photo 7: Corrosion on piping and conduits



Photo 8: Hanging pipe near west end; Note corrosion on piping and conduits

TUNNEL INSPECTION REPORT

ST. ELIZABETHS HOSPITAL – WEST CAMPUS
WASHINGTON, D.C.
TUNNEL BETWEEN BUILDINGS 6 & 8



EAST PORTAL



WEST PORTAL

Report Prepared by:
Burgess & Niple, Inc.
4160 Pleasant Valley Road
Chantilly, VA 20151

Inspection Date: 12/13/05

TUNNEL IDENTIFICATION AND DESCRIPTION

Lining Material	Brick
Total Length	110.0 FT
Springline Width	N/A
Begin Building	6
End Building	8

Tunnel Height	6.6 FT
Year Constructed	1900 (est.)
Year Reconstructed	
Entry Through Building	8

Tunnel connects the basement level of Building 6, Pine to the basement level of Building 8, Willow. Currently access is permitted through the stairwell in Building 8; however, the original hallway that the rails entered at Building 8 has been closed with masonry block.

LOCATION MAP



EXECUTIVE SUMMARY

This tunnel is 110 feet long and runs between Buildings 6 and 8. Building 8 is at the east end of the tunnel and Building 6 is at the west end. The tunnel lining is composed of brick, timber, and concrete and is in fair condition. Utilities within the tunnel at the time of inspection include water, steam, electric, and telephone; none of which were functioning. Minor problems at this time include debris on floor and deteriorated utilities unsupported in areas.

RECOMMENDATIONS**Critical Repairs:**

None.

Priority Repairs:

None.

Routine Repairs:

1. Remove debris from floor, 5 CY.
2. Replace lighting conduits and wiring, 110 LF.
3. Replace electric lines, 110 LF.

FIELD INSPECTION REPORT**STRUCTURE NO. 6-8**
INSPECTION DATE: 12/13/05

CONDITION RATING CODES			
N 9 8 7 6 5 4 3	NOT APPLICABLE EXCELLENT CONDITION VERY GOOD CONDITION – no problems noted. GOOD CONDITION – some minor problems. SATISFACTORY CONDITION – structural elements show some minor deterioration. FAIR CONDITION – all primary structural elements are sound but may have minor section loss, cracking, spalling, or scour. POOR CONDITION – advanced section loss, deterioration, spalling, or scour. SERIOUS CONDITION – loss of section, deterioration, spalling, or scour have seriously affected primary structural components. Local failures are possible. Fatigue cracks in steel or shear cracks in concrete may be present.	2 1 0	CRITICAL CONDITION – advanced deterioration of primary structural elements. Failure cracks in steel or shear cracks in concrete may be present or scour may have removed substructure support. Unless closely monitored it may be necessary to close the structure until corrective action can be taken. “IMMINENT” FAILURE CONDITION – major deterioration or section loss present in critical structural components or obvious vertical or horizontal movement affecting structure stability. Structure is closed to traffic but corrective action may return structure to light service. FAILED CONDITION – out of service; beyond corrective action.

CONDITION RATING CODE EQUIVALENTS FOR SUB-ELEMENTS

G = GOOD (CODES 7 – 9) F = FAIR (CODES 5 – 6) P = POOR (CODES 0 – 4)

59. TUNNEL	7
1. LINING	G
2. PORTALS	G
3. FLOOR	G
4. DRAINS & DRAINAGE	G
5. VENTILATION	G
6. OTHER (Debris)	F
7. OTHER	N
8. OTHER	N

59.6	Minor to moderate debris scattered on floor.
402.1	Steam pipes are wrapped with exposed sections showing signs of moderate corrosion.
402.2,3	Heavy corrosion on water pipes and electrical conduits.
402.6	Phone wires loose from ceiling with loss of coating.
402.1,2,3,6	Utilities are loose and unsupported in areas.

401. ACCESS ROOM	N
1. WALL	N
2. CEILING	N
3. FLOOR	N
4. STAIRWAY	N
5. OTHER	N
6. OTHER	N
7. OTHER	N

402. UTILITIES	4
1. STEAM	P
2. WATER	P
3. ELECTRICAL	P
4. GAS	N
5. FIBER OPTIC	N
6. OTHER (telephone)	P
7. OTHER	N
8. OTHER	N

PHOTOS



Photo 1: East portal; Note blocked off access way



Photo 2: West portal; Note hanging and unsupported utilities

FIELD INSPECTION REPORT

STRUCTURE NO. 6-8
INSPECTION DATE: 12/13/05



Photo 3: Looking west from east portal;
Note minor debris and dampness on floor



Photo 4: Looking east; Note debris and sagging cable



Photo 5: Looking west toward west portal; Note debris and unsupported utilities

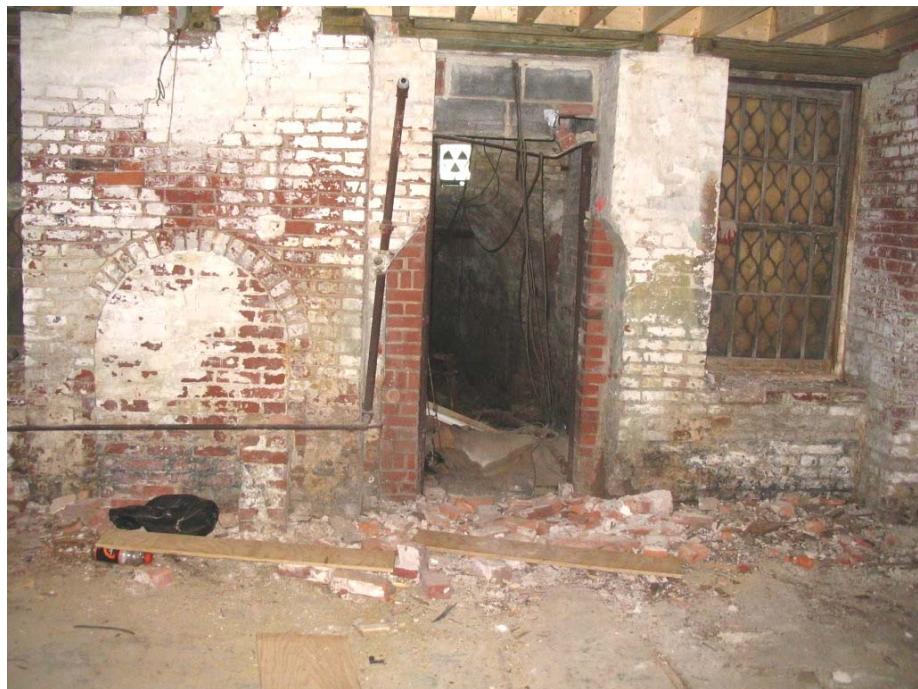


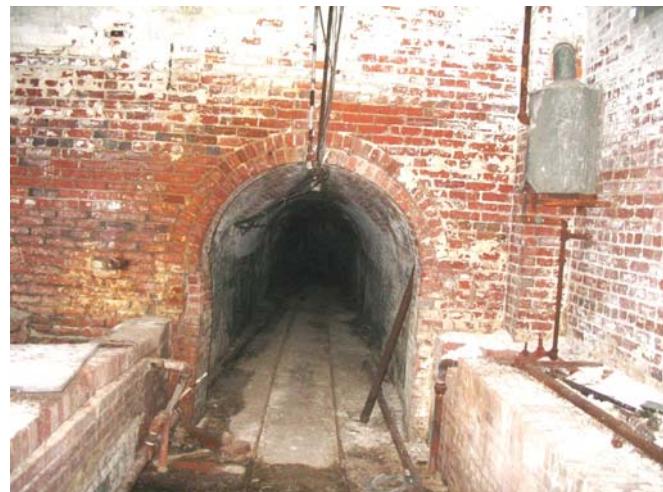
Photo 6: Looking south at access to Building 28

TUNNEL INSPECTION REPORT

ST. ELIZABETHS HOSPITAL – WEST CAMPUS
WASHINGTON, D.C.
TUNNEL BETWEEN BUILDINGS 6 & 28



NORTH PORTAL



SOUTH PORTAL

Report Prepared by:
Burgess & Niple, Inc.
4160 Pleasant Valley Road
Chantilly, VA 20151

Inspection Date: 12/13/05

TUNNEL IDENTIFICATION AND DESCRIPTION

Lining Material	Brick
Total Length	120.0 FT
Springline Width	6.0 FT
Begin Building	6
End Building	28

Tunnel Height	6.5 FT
Year Constructed	1900 (est.)
Year Reconstructed	
Entry Through Building	28

Tunnel connects the basement level of Building 6, Pine to the basement level of Building 28, Linden. Currently access is permitted through the stairwell in Building 28.

LOCATION MAP

EXECUTIVE SUMMARY

This tunnel is 120 feet long by 6 feet wide and runs between Buildings 6 and 28. Building 28 is at the south end of the tunnel and Building 6 is at the north end. The tunnel lining is composed of brick and is in fair condition. Utilities within the tunnel at the time of inspection include water, electric, and telephone; none of which were functioning. Minor problems at this time include debris on the floor and deteriorated utilities.

RECOMMENDATIONS**Critical Repairs:**

None.

Priority Repairs:

None.

Routine Repairs:

1. Remove debris from floor, 5 CY.
2. Replace electric lines, 120 LF.
3. Replace lighting conduits and wiring, 120 LF.

FIELD INSPECTION REPORT**STRUCTURE NO. 6-28**
INSPECTION DATE: 12/13/05

CONDITION RATING CODES			
N 9 8 7 6 5 4 3	NOT APPLICABLE EXCELLENT CONDITION VERY GOOD CONDITION – no problems noted. GOOD CONDITION – some minor problems. SATISFACTORY CONDITION – structural elements show some minor deterioration. FAIR CONDITION – all primary structural elements are sound but may have minor section loss, cracking, spalling, or scour. POOR CONDITION – advanced section loss, deterioration, spalling, or scour. SERIOUS CONDITION – loss of section, deterioration, spalling, or scour have seriously affected primary structural components. Local failures are possible. Fatigue cracks in steel or shear cracks in concrete may be present.	2 1 0	CRITICAL CONDITION – advanced deterioration of primary structural elements. Failure cracks in steel or shear cracks in concrete may be present or scour may have removed substructure support. Unless closely monitored it may be necessary to close the structure until corrective action can be taken. “IMMINENT” FAILURE CONDITION – major deterioration or section loss present in critical structural components or obvious vertical or horizontal movement affecting structure stability. Structure is closed to traffic but corrective action may return structure to light service. FAILED CONDITION – out of service; beyond corrective action.

CONDITION RATING CODE EQUIVALENTS FOR SUB-ELEMENTS		
G = GOOD (CODES 7 – 9)	F = FAIR (CODES 5 – 6)	P = POOR (CODES 0 – 4)

59. TUNNEL	6
1. LINING	G
2. PORTALS	F
3. FLOOR	G
4. DRAINS & DRAINAGE	G
5. VENTILATION	G
6. OTHER (debris)	F
7. OTHER	N
8. OTHER	N

59.2	Separated bricks along arch ring on west side of south portal.
59.6, 402.2	Minor to heavy debris on floor. Water utility on floor.
402.2,3,6	Moderate to heavy corrosion on pipes and conduits. Sections of electrical and phone wiring hanging from ceiling.

401. ACCESS ROOM	N
1. WALL	N
2. CEILING	N
3. FLOOR	N
4. STAIRWAY	N
5. OTHER	N
6. OTHER	N
7. OTHER	N

402. UTILITIES	4
1. STEAM	N
2. WATER	P
3. ELECTRICAL	P
4. GAS	N
5. FIBER OPTIC	N
6. OTHER (telephone)	P
7. OTHER	N
8. OTHER	N

PHOTOS



Photo 1: North portal

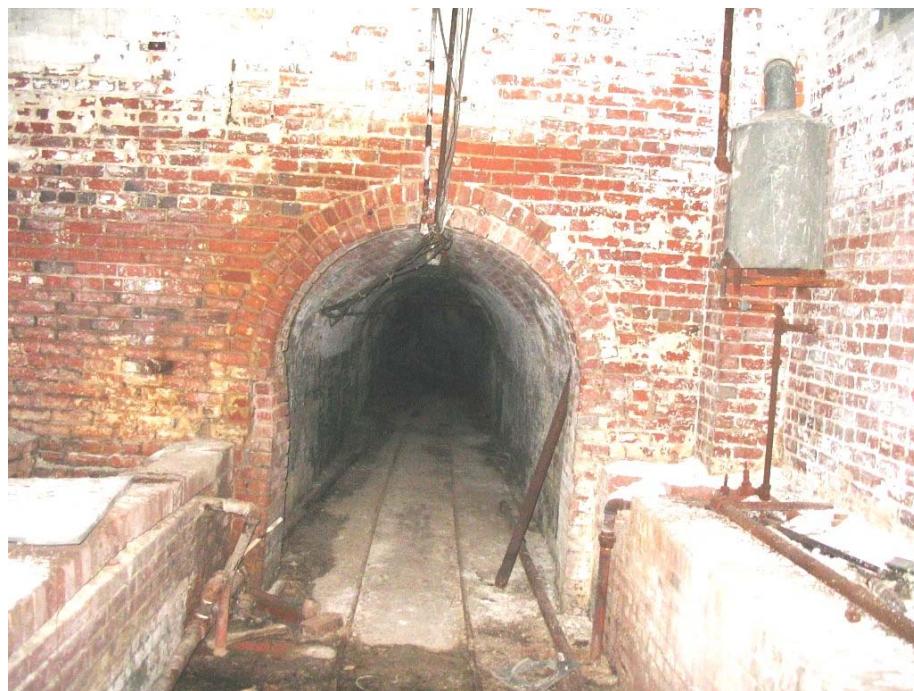


Photo 2: South portal

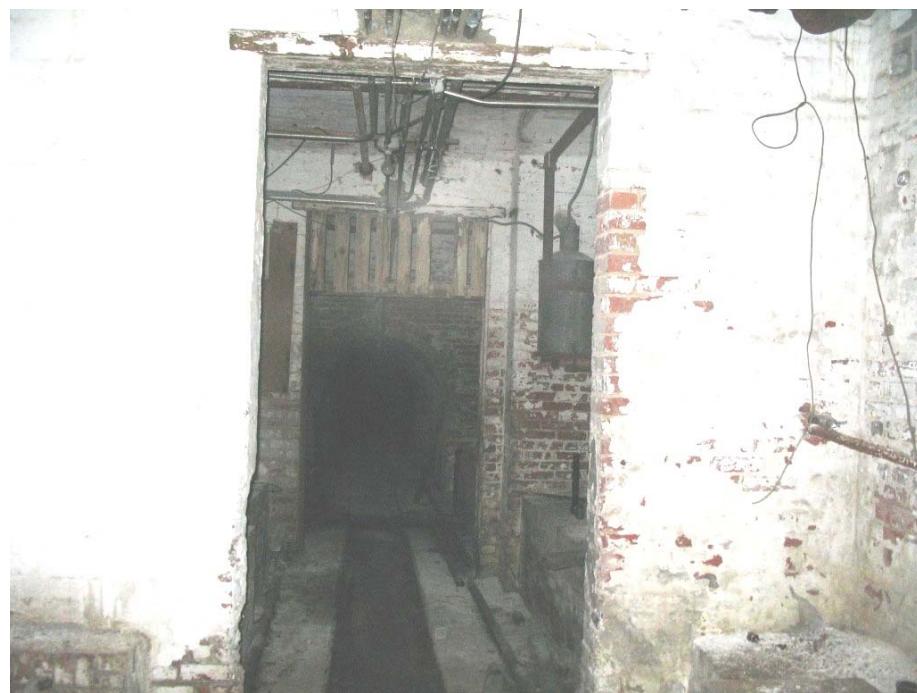


Photo 3: Looking north at south portal from Building 28

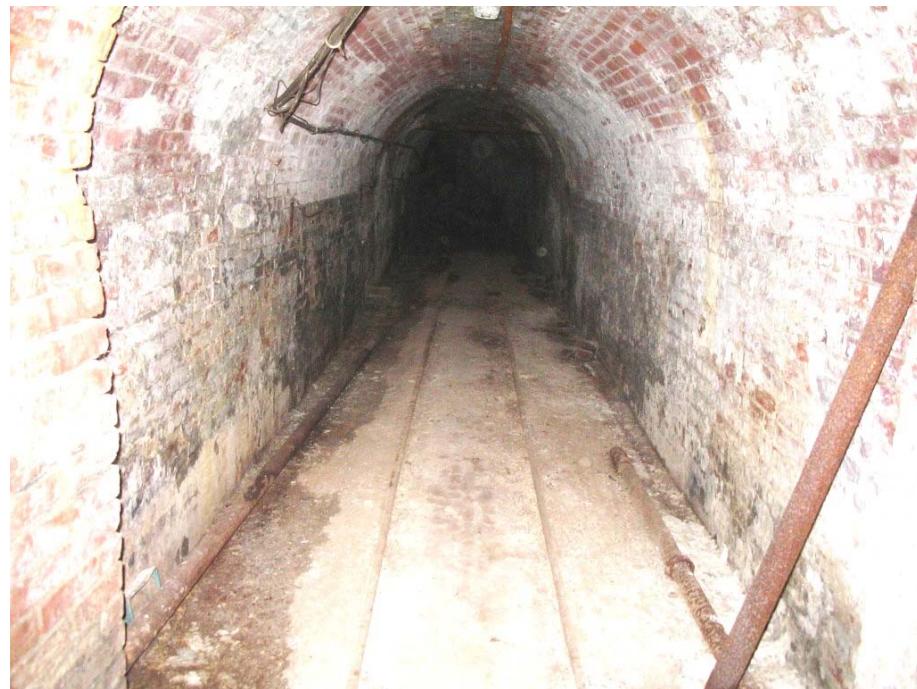


Photo 4: General view of lining, looking north from south portal

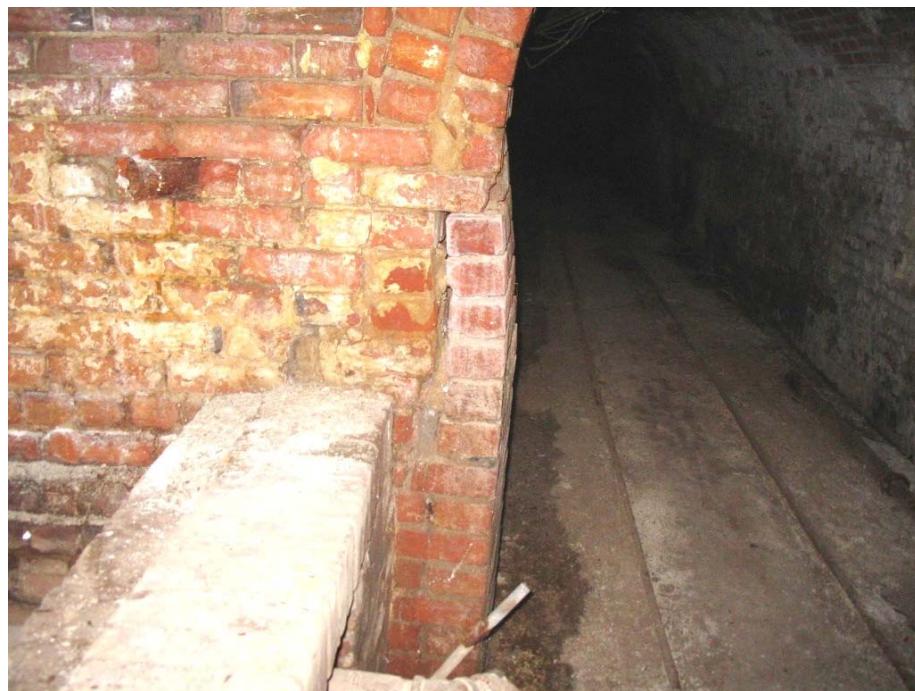


Photo 5: Deteriorated mortar joints on west wall of south portal, looking north



Photo 6: Deteriorated mortar joints on west wall of south portal, looking south



Photo 7: Missing bricks at vault connecting to Building 6



Photo 8: Debris on floor near entrance to Building 6



Photo 9: Corrosion on conduits; Note damaged light fixture

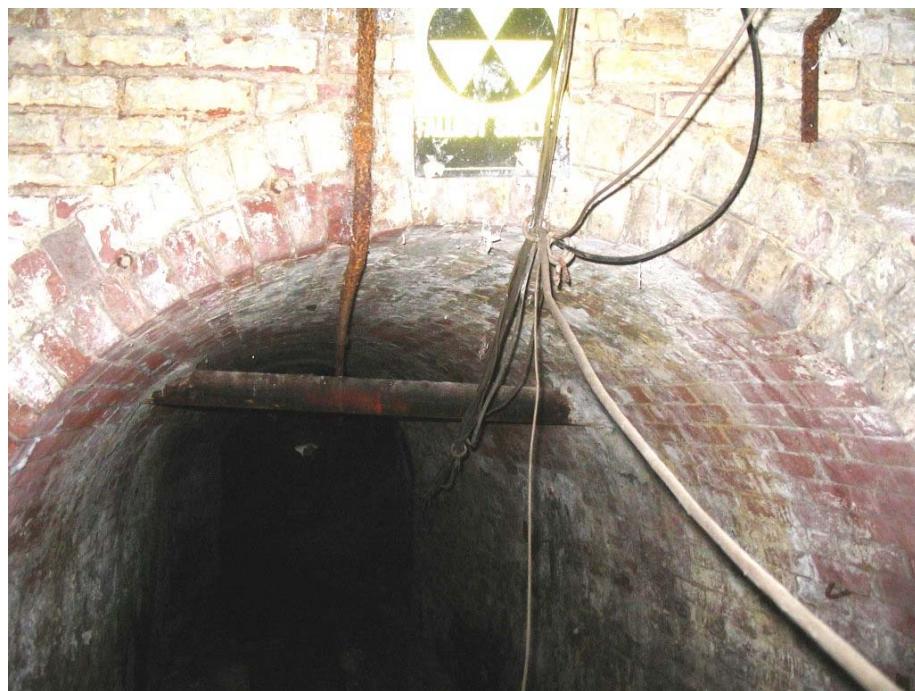
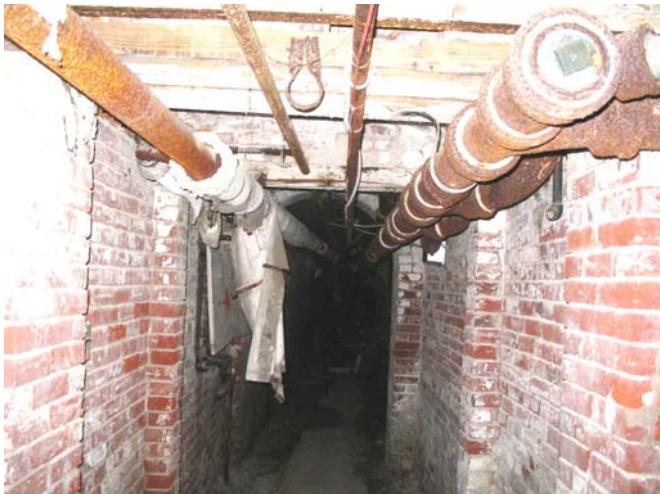


Photo 10: Hanging telephone and electric wires at north end of arch;
Note corrosion on conduit

TUNNEL INSPECTION REPORT

ST. ELIZABETHS HOSPITAL – WEST CAMPUS
WASHINGTON, D.C.
TUNNEL UNDER BUILDING 8



EAST PORTAL



WEST PORTAL

Report Prepared by:
Burgess & Niple, Inc.
4160 Pleasant Valley Road
Chantilly, VA 20151

Inspection Date: 12/13/05